



Energy Efficiency in Iowa

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**Iowa Office of Energy
Independence**

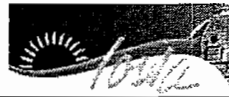
Energy Efficiency



**What if Edison had won instead
of Watts?**

2

Energy Efficiency



**Efficiency potential exists everywhere
that energy is used!**

- Reduces stress on overtaxed infrastructure
- Reduces dependence on imported fuels
- Increases productivity
- Reduces cost of government
- Reduces environmental impact

3

Energy Efficiency*



- Investing in Energy Efficiency with utilities
- Energy Efficiency Resource Standards (EERS)
- Combined Heat & Power (CHP)
- Building Energy Codes
- Transportation Policies
- Appliance & Equipment Efficiency standards
- Tax Incentives
- State Lead by Example and Research & Development

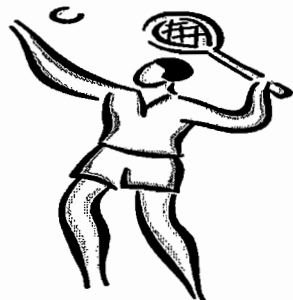
*selected policy options adapted from ACE³ 2006 Energy
Efficiency Scorecard

4

Measuring for Results



- Previous policy options require follow through and measurement to ensure results



5

Investment in Energy Efficiency



- Determine value and need for energy efficiency programs
- Administer & deliver energy efficiency and customer energy programs
 - Low-income Energy
 - Renewable Energy
- Provide monetary support
 - New programs
 - Staffing
 - Promotions/Marketing

6

Energy Efficiency Resource Standards (EERS)



- Mandate specific level of energy savings; generally administered by state utility commissions
- Programs such as energy efficiency savings and/or purchasing energy efficiency credits in trading system.
- Sustainable Energy Portfolio Standards (SEPS) allow for mix of resources to contribute to target; can be adjusted to state's specific resources and needs.

7

Combined Heat & Power (CHP)



- Cogeneration; generate power and thermal energy from single fuel source.
- Use heat recovery technology to capture heat that is otherwise wasted; use it for heating and cooling.
- Generate power onsite; decrease dependence on electric grid and reduce bulk transmission losses.
- State policy measures:
 - Streamlined interconnection rules for distributed generation;
 - Financial incentives;
 - RPS and EERs – eligible technology;
 - Output-based regulations and output-based allocations of emissions

8



Building Energy Codes

- 40% of total energy use/greenhouse gas emissions and 65% of total electricity consumption is used in building energy.
- Must target building efficiency prior to construction; mandatory building energy codes & follow through.
- 3 main codes developed and used:
 - Model Energy Code (MEC);
 - International Energy Conservation Code (IECC)*;
 - American Society of Heating, Refrigerating and Air-Conditioning (ASHRAE)
- Codes adopted and state level, but enforced at local level.

* IA adopted most recent version of IECC (2006)

9



Transportation Policies

- 28% energy use and 70% of petroleum consumption is used by the transportation sector of the U.S.
- No progress has been made on fuel economy of U.S. vehicles.
- State transportation groups, transit agencies, regional groups can work together to plan and fund mainstream transportation.
- Ideas for state policy:
 - Tailpipe emission standards,
 - Tax incentives for fuel-efficient vehicles,
 - State fleet requirements
 - Increased rail options including intermodal
 - Capitalize on telecommuting

10



Appliance & Equipment Efficiency Standards

- Everywhere energy-consuming appliances and equipment are used
- Extra (non-needed) energy consumed by less efficient products adds up to large amounts of wasted energy.
- Appliance efficiency standards require manufacturers to meet minimum levels.
- Save consumers money by lowering operation costs and removing inefficient products from the market.
- Federal appliance efficiency standards preempt state standards, but states need to take the lead on developing standards for products not already regulated.

11



Tax Incentives

Many states use tax incentives

- Increase use of technologies that provide benefits
- Lower the net cost of efficient products.
- Raise consumer awareness of eligible products; encourage retailers to more actively market products.
- Many forms of incentives:
 - Direct income tax credit;
 - Reduce sale tax on eligible products;
 - Income tax deduction opportunities

12

Lead By Example



- Unique opportunity to lead by example; take action to improve and become a leader in energy efficiency – drive the market
- Energy costs to run state/local government facilities can use almost 10% of a government's annual operating budget.
- Improvements can provide substantial savings, therefore freeing public money for other purposes and increasing public visibility.

13

Research & Development



Iowa Power Fund

- Commercialization
- Research
- Education
- Other opportunities

14

Energy Efficiency



Energy Performance Ratings (EPR)

- External benchmark to assess building's energy efficiency
- Scale of 1 – 100; Portfolio Manager does most of the computing!
- Help identify buildings that need improvement (or recognition)
- Criteria:
 - Evaluate energy performance for the whole building
 - Reflect actual billed energy data
 - Normalize for Operation
 - Provide a peer group comparison

15

Building Efficiency in Iowa



- **473.3 Energy Efficiency Goal** – Iowa more efficiently utilizes energy resources. Implement goal through development of programs that promote energy efficiency and that enhance the energy efficiency industry.
- **473.13A Energy Conservation Measures** – identify and implement energy conservation measures (identified through energy audits and engineering analyses).
- **473.19 Iowa Energy Bank Program** – DNR provides financial assistance and technical support for energy conservation measures to state agencies, political subdivisions, schools/colleges, non-profits

16

Building Efficiency in Iowa



Life Cycle Cost Analysis:

- The Code of Iowa requires that a life cycle cost analysis be completed for new buildings over twenty thousand square feet and for major renovations.
- Reports are submitted to the Department of Public Safety (Building Code Bureau); DNR completes technical review and approval (must be approved before contracts for the construction or renovation are let).
- FY07 reports represent annual savings of \$266,135 and life cycle cost savings of \$3,118,876. (Incremental financing for two of these reports will be done in FY 08 (amounting to annual savings of \$71,139 with life cycle cost savings of \$852,910).

17

Building Efficiency in Iowa



Energy Conservation Measures –

construction, rehabilitation, acquisition, or modification of an installation in a facility or vehicle which is intended to reduce energy consumption and/or energy costs.

18

Building Efficiency in Iowa



Executive Order 41 (April 22, 2005)

- Identify & implement energy efficiency measures to reduce consumption in 2010 by 15% of the levels in 2000;
- Purchase the lowest life cycle cost equipment possible. Also implement life cycle cost analysis on new construction/renovations;
- 10% of electric consumption comes from alternate energy;
- 2010: 100% of non-law enforcement, light-duty vehicles must be alternative fuel or hybrid-electric vehicles;
- Bulk diesel fuel purchased has 5% renewable content by 2007, 10% by 2007, and 20% by 2010. Operate on biodiesel blend as available.

19

Building Efficiency in Iowa



Lead by Example

Overcome lack of technical information and financing to deliver programs that deliver technical integrity and transparency

20

Building Efficiency in Iowa

Opportunity to Grow

- Strengthen EO 41:
 - Increase the required reduction in energy use;
 - Require state facilities to implement cost effective projects
- Amend Iowa Code 473.13A to mandate all state facilities:
 - have a new comprehensive round of energy evaluations;
 - Develop energy management plans based on energy evaluations that identify:
 - improvements to be made,
 - establish implementation timelines,
 - identify funding sources for implementation

21

Building Efficiency in Iowa

Opportunity to Lead

- Re-energize Energy Bank/SIFIC.
- Deploy marketing staff to promote energy efficiency programs. Create funding stream to pay for marketing as well as facilitation through energy savings.
- Collaborate with utilities

22

Building Efficiency in Iowa

New technology options

○ Lighting

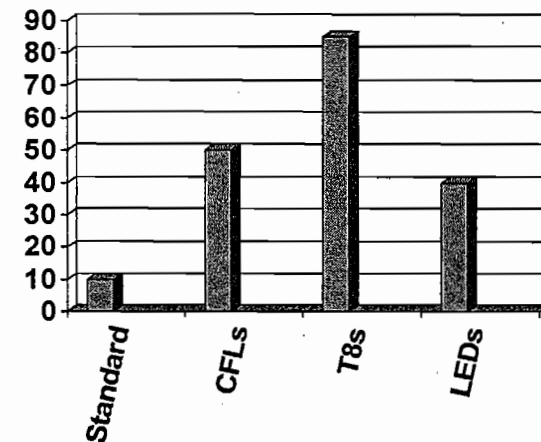
- CFLs
- T8s *- commercial*
- LEDs

○ Desiccant Cooling

23

Building Efficiency in Iowa

What's the Difference (lumens/watt)



24

Building Efficiency in Iowa



New technologies to lead with

- **Desiccant Cooling**
 - Open heat driven cycle used to achieve cooling and dehumidification
 - Can be combined with a conventional air conditioning system
 - Reduce humidity entering – stay cool/comfortable at a slightly higher temp.
 - Improve indoor air quality; decrease potential for mold growth & other pollutants
 - Could reduce electricity demand by 25%

25

Efficiency Programs



ENERGY STAR® (EPA & DOE)

- Offices are almost 40% less energy & cost intensive than average building
- Homes are 20-30% more efficient than standard home
- Includes manufacturing & products
 - Washing machines;
 - Windows;
 - Lighting;
 - ENERGY STAR® label on over 30 various products

26

Efficiency Programs



ENERGY STAR® (EPA & DOE)

To receive the ENERGY STAR® plaque:

- Score 75 or higher on 1-100 EPR scale & meet current industry standards for indoor environment quality
- Licensed Professional engineer verifies:
 - Correct benchmarking of building,
 - Building adheres to current industry standards for thermal comfort, outside air ventilation, control of indoor air pollutant and illumination.

27

Efficiency Programs



Building America (DOE)

GOAL: Develop cost-effective systems for new homes that can produce as much energy as they use – a **net zero energy home**

Through research find energy efficiency solutions for housing:

- Produce homes with 30-90% less energy usage
- Improve productivity
- Reduce construction time and waste
- Provide new product opportunities
- Implement innovative energy/material saving technologies

28

Efficiency Programs



- Home Performance with Energy Star (HPwES)
- Joint program between US DOE and US EPA
- Existing residential with a holistic approach
- Programs in several states across the country

Green Construction

Example: Osage, Iowa



Energy Efficiency for Economic Development

- Every \$1 spent in Osage generates \$1.90 of economic activity
- Petroleum products ➡ \$1.51
- Utility services ➡ \$1.66
- Energy efficiency ➡ \$2.23
- By doing energy efficiency, Osage was able to attract desirable industries due to reduced energy operating costs

30

Example: Austin Energy



Energy Efficiency Virtual Power Plant

- "Built" exclusively of energy efficiency materials
 - Enforced energy efficiency building costs
 - Rebates for high efficiency appliances
 - Other programs and policies
- 550 MW in energy savings in about 12 years
- During this time period, Austin's population doubled & local economy grew by 46%
- Enabled Austin to take a coal-fired power plant off the utility's planning books.

31

Example: Austin Energy



○ Power Saver™ Program—Saving Energy Together

Rebates and low-interest loans to help residential and business customers conserve energy, save money and improve comfort.

- Programs for Commercial Sources to generate additional power, lower long-term investment costs for electric facilities, and to help protect the environment.
- **GreenChoice®** offers electricity from clean, renewable sources.

32



**Questions & Comments
are
Welcomed**